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REMARKS

The Specification has been amended to correct minor informalities. Claims 1, 14, 19-23, 37-38, 40-41, 81-82, 86-88, 94, 96, 98, 102, 104, 109-114, and 116-118 have been amended, and claims 12 and 115 have been canceled. Therefore, claims 1-11, 13-41, 81-114, and 116-119 are currently pending in the case. Further examination and reconsideration of the presently claimed application are respectfully requested.

Informalities in the Specification and Claims:

The Examiner has identified minor informalities in claim 88, on line 7 and in the Specification on page 38, line 18. The Examiner's careful examination of the claims and the Specification is greatly appreciated. Claim 88 and the paragraph of the Specification on pg. 38, lines 8-24 have been amended to correct the informalities identified by the Examiner.

Section 112, 2nd Paragraph, Rejections:

Claim 41 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office Action states that "In claim 41, line 2, 'the rod lens array' has no antecedent basis." (Office Action -- page 4). Claim 41 has been amended to correct the antecedent problems identified by the Examiner. Accordingly, removal of the § 112, second paragraph, rejection of claim 41 is respectfully requested.

Section 103 Rejections:

Claims 1-41 and 81-119 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,585,916 to Miura et al. (hereinafter "Miura") in view of U.S. Patent No. 5,274,434 to Morioka et al. (hereinafter "Morioka"), U.S. Patent No. 6,496,256 to Rytan et al. (hereinafter "Rytan"), and U.S. Patent No. 6,259,108 to Antonelli et al. (hereinafter "Antonelli"). Claims 12 and 115 have been canceled thereby rendering their rejections moot. As will be set forth in more detail below, the §103(a) rejections of claims 1-11, 13-41, 81-114, and 116-119 are respectfully traversed.

To establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond*, 910 F.2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990). The cited art does not teach or suggest all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

The cited art does not teach or suggest a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer. Amended independent claim recites in part "wherein the specimen comprises a wafer having repeatable pattern features, and wherein the contact image sensor is further configured to acquire images of the repeatable pattern features and the wafer without contacting the wafer." Amended independent claims 41, 81, 82, 86-88, 109, 114, and 118 recite similar limitations. Support for the amendments to the independent claims can be found in the Specification, for example, on page 18, lines 5-6, page 26, line 30 - page 27, line 3, and page 37, lines 15-24.

Miura discloses a surface inspecting device. Miura, however, does not disclose a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer. For example, Miura states that "a particle inspecting optical system at the back side (blank surface) 1a of a glass substrate 1 of a reticle is illustrated. Actually, the device is provided with an additional particle inspecting optical system for inspection of a pellicle film for protecting the front surface (circuit pattern bearing surface) of the glass substrate of the reticle against any particles." (Miura -- col. 4, lines 19-25). As is known to one of ordinary skill in the art, pellicle films do not contain repeatable pattern features since such features would interfere with imaging of the reticle. Therefore, Miura discloses inspecting two blank surfaces of a reticle (i.e., surfaces of a reticle that do not include repeatable pattern features). As such, Miura does not teach or suggest a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer, as recited in claims 1, 41, 81, 82, 86-88, 109, 114, and 118. Consequently, Miura does not teach or suggest all limitations of claims 1, 41, 81, 82, 86-88, 109, 114, and 118.

Furthermore, Miura cannot be combined with Morioka, Eytan, Antonelli, or any combination thereof to overcome the deficiencies therein. For example, Morioka discloses a method and apparatus for

inspecting foreign particles on a real time basis in a semiconductor production line. However, Morioka does not disclose a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer. For example, Morioka states:

The diffraction light 901 from the repetition pattern having regularity from the product wafer 111 becomes a regular image 902 at the position of the spatial filter 804 on the Fourier transform plane of the lens array 503. Therefore, the spatial filter 504 such as shown in the drawing can block the repetition pattern of the product wafer 111 having regularity, and the pattern is not taken into the CCD linear sensor 505 as the detector. (Morioka -- col. 9, lines 47-55).

Therefore, Morioka states that spatial filters are used to remove light diffracted from the repetition pattern on a product wafer. As such, images formed by the systems and methods of Morioka will not include images of repeatable pattern features on the product wafer. In addition, Morioka teaches that removing the light diffracted from the repetition pattern allows foreign particles to be detected with high sensitivity. For example, Morioka also states that "the light outgoing in the specific direction from the repetition portion in the case of the memories can be blocked by a spatial filter and hence, the foreign particles which do not occur repeatedly can be detected with high sensitivity." (Morioka -- col. 4, lines 17-21.) Therefore, Morioka does not suggest or provide motivation for forming images of the repetition patterns on a wafer since Morioka teaches that such images reduce the sensitivity of foreign particle detection.

Moreover, Morioka states that "If a refractive index changeable type lens array is used as the imaging lens 212, the present invention can further reduce the scale of the apparatus....However, the present invention must use the spatial filter." (emphasis added, Morioka -- col. 16, lines 60-61). Therefore, although Morioka teaches forming images of a product wafer, the images formed by Morioka cannot include images of features on the product wafer since Morioka teaches that the light diffracted from the repetition pattern must be blocked by the spatial filter. As such, Morioka does not teach or suggest a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer, as recited in claims 1, 41, 81, 82, 86-88, 109, 114, and 118. Consequently, Morioka does not teach or suggest all limitations of claims 1, 41, 81, 82, 86-88, 109, 114, and 118 and cannot be combined with Miura to overcome deficiencies therein.

Eytan discloses inspection systems using sensor array and double threshold arrangements. However, Eytan does not disclose a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer. For example, like Morioka, Eytan discloses forming an image of a wafer that does not include images of features on the wafer. In particular, Eytan

discloses removing the images of the features on the wafer electronically instead of with a spatial filter as taught by Morioka. For example, Eytan states that "since the array is placed in the Fourier plane, it is anticipated that constructive diffraction will take place so that high intensity spots will be created in the Fourier plane. In order to avoid confusing such scattering as being defects, these spots are removed." (Eytan -- col. 3, lines 43-48.) Eytan also states that "A notable feature of the invention is the combination of CMOS camera placed at the Fourier plane. This structure eliminates the need for a spatial filter, since the camera itself serves the function of a filter." (Eytan -- col. 4, lines 36-40). Therefore, Eytan teaches that images of a wafer do not include images of features on the wafer since images of the features are removed to avoid confusion between defects and features.

Moreover, Eytan appears to teach away from the claimed contact image sensor. For example, Eytan states that "When these features are illuminated by a coherent light beam, they diffract the light in much the same manner as a diffraction grating would diffract the light. However, such constructive diffraction can be mistaken by the system for a defect. One way to overcome such a problem is to use a spatial filter in the Fourier plane." (Eytan -- col. 2, lines 7-12). Therefore, Eytan teaches that light diffracted from features on a substrate will cause error in defect detection methods. In addition, Eytan states:

since bright field system construct an actual image of the inspected area, the image includes multitude of structural elements built upon the wafer. Thus, the resulting image looks much like a maze, and it is increasingly difficult to detect a small irregularity in the maze-like image. Thus, the system requires a complicated image processing algorithm to recognize the defect, thereby increasing the processing power and time required and increasing the cost of purchasing and operating the system. It is not clear at this time whether even the most sophisticated algorithm may be unable to detect such small irregularities. (Eytan -- col. 2, lines 45-55).

Therefore, Eytan teaches that imaging structural elements on a wafer increases the difficulty and complexity of defect detection, and may even prevent defect detection. As a result, Eytan appears to teach away from a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). MPEP 2141.02. As such, Eytan does not teach or suggest a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer, as recited in claims 1, 41, 81, 82, 86-88, 109, 114, and 118. Consequently, Eytan does not teach or suggest all limitations of claims 1, 41, 81,

82, 86-88, 109, 114, and 118 and cannot be combined with Miura and/or Morioka to overcome deficiencies therein.

Antonelli discloses a fingerprint image optical input apparatus. However, Antonelli does not disclose a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer. For example, Antonelli states that "The generally preferred embodiment is a miniaturized CIS sensor arranged to view the width of the moving fingerprint as it is wiped over the optically transparent platen of the sensor." (Antonelli -- col. 1, lines 61-64.) Therefore, Antonelli teaches that a fingerprint to be viewed is brought into contact with the sensor and wiped over the sensor as shown in Fig. 2 of Antonelli. Antonelli also states that "Where the fingerprint ridges touch the top surface of the platen, light is not reflected, due to FTIR at the surface of the platen causing absorption of light, resulting in a dark pattern for the fingerprint ridges and bright light at the fingerprint valleys, which are reflected by TIR from the interior of the platen." (Antonelli -- col. 2, lines 24-29.) Therefore, Antonelli teaches that contact between the fingerprint and the platen of the sensor allows imaging of the fingerprint. In addition, Antonelli states that "The total internal reflection surface of the platen can be raised strip to increase the pressure of the finger on the imaging surface, thereby giving better contact for total internal reflection." (Antonelli -- col. 2, lines 31-34.) Therefore, Antonelli teaches that increased contact between a fingerprint and a platen of the sensor improves imaging of the fingerprint. In this manner, Antonelli does not teach, suggest, or provide motivation for a contact image sensor configured to acquire images of a fingerprint without contacting the fingerprint. As such, Antonelli does not teach or suggest a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer, as recited in claims 1, 41, 81, 82, 86-88, 109, 114, and 118. Consequently, Antonelli does not teach or suggest all limitations of claims 1, 41, 81, 82, 86-88, 109, 114, and 118 and cannot be combined with Miura, Morioka, Eytan, or any combination thereof to overcome deficiencies therein.

Therefore, none of the cited art, either individually or in any combination thereof, teaches, suggests, or provides motivation for a contact image sensor configured to acquire images of repeatable pattern features on a wafer without contacting the wafer, as recited in claims 1, 41, 81, 82, 86-88, 109, 114, and 118. Consequently, the cited art does not teach, suggest, or provide motivation for all limitations of claims 1, 41, 81, 82, 86-88, 109, 114, and 118.

For at least the reasons set forth above, claims 1, 41, 81, 82, 86-88, 109, 114, and 118 are patentably distinct over the cited art. Therefore, claims dependent therefrom are also patentably distinct.

over the cited art for at least the same reasons. Accordingly, removal of the § 103(a) rejections of claims 1-11, 13-41, 81-114, and 116-119 is respectfully requested.

CONCLUSION

This response constitutes a complete response to the issues raised in the Office Action mailed December 8, 2003. In view of remarks traversing rejections, Applicants assert that pending claims 1-11, 13-41, 81-114, and 116-119 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned earnestly requests a telephone conference.

PETITION UNDER 37 C.F.R. § 1.136 FOR EXTENSION OF TIME

Applicants respectfully petition the Commissioner for a one month extension of time under 37 C.F.R. § 1.136 within which to respond to the Office Action mailed December 8, 2003, such extension allowing the undersigned until April 8, 2004 to respond.

The Commissioner is authorized to charge the required fee or credit any overpayment to Conley, Rose, P.C. Deposit Account No. 03-2769/5589-02701.

Respectfully submitted,



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